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AUTHOR	Blaschke, Thomas J.; And Others
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ABSTRACT

Procedures are outlined for estimating changes in parenthood and marital status for respondents of the National Longitudinal Study of the High School Class of 1972 (NLS). Seven key variables that summarize the information on parenthood and marital status are estimated: number of children as of the first week of October in 1973, 1974, and 1976, a composite estimate of the date of first marriage; and marital status as of the first week of October in 1973, 1974, and 1976. To facilitate the adoption of procedures by other users, a FORTRAN subroutine that creates these variables is provided. The documentation accompanying the subroutine gives the technical details of the procedures outlined. (Author/GK)

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PREFACE

The National Longitudinal Study (NLS) of the High School Class of 1972 is a large-scale, longitudinal survey effort designed to provide information on high school students as they move into early adulthood. The NLS was originally motivated by a need for data with which to analyze critical issues in educational policy, but it has taken on much broader significance as a data base that can support policy analysis on a variety of issues.

The Rand Corporation, under contract to the National Institute of Child Health and Human Development (NICHD), is currently using the NLS data base to analyze the consequences of adolescent parenthood. Because the measures of several demographic variables in the NLS file correspond inexactly to the precise demographic characteristics needed in the study, the authors of this Note are devising procedures that will permit this incomplete information to be used without exceeding its limits.

The technical solutions to these problems, although time-consuming, are essential to the scientific validity of the research. They are also likely to have considerable value to other researchers using the NLS data base, particularly where demographic or life-cycle concepts are involved. In view of the potential scientific gains and cost savings to others in the research community, the authors have adopted a policy of fully documenting and disseminating the solutions to these problems. Other researchers using the NLS may wish to adopt the solution or to adapt it to their needs.

This Note is the first in a projected series of technical reports that will describe these problems and their solutions. It focuses on a determination of the NLS respondents' parenthood and marital status at three points in time--the first week in October in 1973, 1974, and 1976.

SUMMARY

Users of the National Longitudinal Study of the High School Class of 1972 (NLS) often need to track the processes whereby families are formed, expanded, and dissolved. Specific variables that mark these processes--changes in marital status and parenthood status--are imperfectly measured by the NLS. The information they furnish is both ambiguous and inconsistent; in many cases, important items are missing, raising the possibility of systematic biases in analyzing the data.

This Note outlines procedures we have devised for estimating changes in parenthood and marital status for NLS respondents. Variables that summarize the information on parenthood and marital status are estimated: number of children as of the first week of October in 1973, 1974, and 1976; a composite estimate of the date of first marriage; and marital status as of the first week of October in 1973, 1974, and 1976.

To facilitate the adoption of our procedures by other users, we provide a FORTRAN subroutine that creates these variables.

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I. INTRODUCTION

Users of the NLS data will frequently need to track the processes whereby families are formed, expanded, and dissolved. Specific variables that mark these processes--changes in marital status and parenthood status--are imperfectly measured by the NLS and must be used with care. The information they furnish is both ambiguous and inconsistent; in many cases, important items are missing, raising the possibility of systematic biases in analyzing the data.

For our analyses, we needed to estimate when the NLS respondents first became parents. We also needed to estimate when changes in marital status occurred. As will be seen below, the NLS data base does not lend itself well to making precise determinations of these changes.

The current NLS data base provides a voluminous file of information on 22,652 members of the Class of 1972. The data were gathered by an initial base-year survey in the spring of 1972 and supplemented by three follow-up surveys administered in 1973, 1974, and 1976. Although the response rates for each survey were quite high, only 62 percent of the subjects responded to all four surveys (see Fig. 1). Moreover, many individuals responded to only a few items on the very lengthy questionnaires, thereby adding to the missing-values problem.*

Information on parenthood and marital status was collected on each of the three follow-up surveys but not on the base-year survey. The primary source of information on parenthood is questions asking how many children the respondent had as of the first week of October 1973, 1974, and 1976.** By responding completely and consistently on just the three follow-up surveys, then, respondents disclose how many children they had at each of three points in time. Claiming at least one

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*For documentation of the NLS data tape and complete details on response rates, see Jay R. Levinsohn, et al., *National Longitudinal Study: Base Year, First, Second, and Third Follow-up Data File Users Manual*, 2 vols., Research Triangle Institute, Chapel Hill, North Carolina, April 1978.

**In 1973 only, respondents also were queried as to whether or not they had any children as of October 1973.

	FREQUENCY OF APPEARANCE		
	N	%	CUM.%
NO WAVE MISSING			
	14,112	62.3	62.3
ONE WAVE MISSING			
	4,903	21.6	83.9
	478	2.1	86.0
	231	1.0	87.0
	788	3.5	90.5
TWO WAVES MISSING			
	118	0.5	91.0
	112	0.5	91.5
	391	1.7	93.2
	18	0.1	93.3
	66	0.3	93.6
	504	2.2	95.8
THREE WAVES MISSING			
	486	2.1	97.9
	309	1.4	99.3
	16	0.1	99.4
	120	0.5	99.9
TOTALS:	22,652	100%	100%

Fig. 1--Patterns of missing waves on NLS

child would qualify a respondent as having entered the parenthood *role* in a sociological sense; whether the respondent was the *biological* parent, however, cannot be determined.

More precise information was elicited on when the respondents first became married, but actual responses frequently were incomplete and inconsistent. Each of the three follow-up surveys inquired about marital status and the date of marriage, but there are frequent inconsistencies and missing values.

This note outlines procedures we have devised for estimating the changes in parenthood and marital status for the NLS respondents from the often inconsistent and incomplete information in the NLS file. To facilitate the adoption of this procedure by other users, we also provide a FORTRAN subroutine in Appendix B. The documentation accompanying that subroutine gives the technical details of the procedures outlined in this note.

The subroutine creates seven key variables that summarize the information on parenthood and marital status contained on the NLS tape. Those variables are:

NCHILD73, NCHILD74, NCHILD76: number of children as of the first week of October in 1973, 1974, and 1976.

MARDATE: A composite estimate of the date of first marriage, based on responses to questions about marriage dates and marital status on all three follow-up surveys.

MAR73, MAR74, MAR76: marital status as of the first week of October in 1973, 1974, and 1976.

These created variables embody important technical refinements that reduce missing values and resolve inconsistencies among responses. The improvements resulting from these technical refinements are indicated in Tables 1 through 7, which compare each of our created variables with the corresponding NLS items. Each table shows frequencies of missing values on both original items and created variables, and hence the extent to which missing values have been reduced.

Table 1

FREQUENCY COUNTS FOR MAR73 (MARITAL STATUS IN OCTOBER 1973) WITH COMPARABLE COUNTS FOR RESPONSES TO FQ7A

	MAR73		FQ7A[a]	
Marital Status	Code	Frequency	Code	Frequency
Single	1	18,045	1,2,21,22	15,528
Currently married	2	3,730	3,43	3,290
Currently separated, divorced, or widowed	3	121	4,44	129
Ever married, current status unknown	4	48	--	--
Unknown	99	708	All others	3,705
Total		22,652		22,652

[a]FQ7A is the marital status item on the First Follow-up Questionnaire. For definitions of the codes, see Levinsohn et al., Vol. 2.

Table 2

FREQUENCY COUNTS FOR MAR74 (MARITAL STATUS IN OCTOBER 1974) WITH COMPARABLE COUNTS FOR RESPONSES TO SQ105

	MAR74		SQ105[a]	
Marital Status	Code	Frequency	Code	Frequency
Single	1	15,200	1,2,21,22	14,226
Currently married	2	5,421	4,44	4,942
Currently separated, divorced, or widowed	3	342	3,23	360
Ever married, current status unknown	4	258	--	--
Unknown	99	1,431	All others	3,124
Total		22,652		22,652

[a]SQ105 is the marital status item on the Second Follow-up Questionnaire. For definitions of the codes, see Levinsohn et al., Vol. 2.

Table 3

FREQUENCY COUNTS FOR MAR76 (MARITAL STATUS IN OCTOBER 1976) WITH COMPARABLE COUNTS FOR RESPONSES TO TQ129

	MAR76		TQ129[a]	
Marital Status	Code	Frequency	Code	Frequency
Single	1	10,864	1,2,21,22	10,896
Currently married	2	8,196	4,44	8,190
Currently separated, divorced, or widowed	3	912	3,23	903
Ever married, current status unknown	4	417	--	--
Unknown	99	2,263	All others	2,663
Total		22,652		22,652

[a]TQ129 is the marital status item on the Third Follow-up Questionnaire. For definitions of the codes, see Levinsohn et al., Vol. 2.

Table 4

FREQUENCY COUNTS FOR NCHILD73 (NUMBER OF CHILDREN IN OCTOBER 1973) WITH COMPARABLE COUNTS FOR RESPONSES TO FQ8B

	NCHILD73		FQ8B[a]	
Number of Children	Code	Frequency	Code	Frequency
None	0	20,559	0,100,200	16
One	1	1,140	1,101,201	917
Two	2	90	2,102,202	93
Three	3	16	3	7
Four or more	4	2	4	1
Missing	99	845	All others	21,618
Total		22,652		22,652

[a]FQ8B is the number-of-children item on the First Follow-up Questionnaire. Single respondents were routed around this question, but some chose to answer it anyway. For definitions of the codes, see Levinsohn et al., Vol. 2.

Table 5

FREQUENCY COUNTS FOR NCHILD74 (NUMBER OF CHILDREN IN OCTOBER 1974) WITH COMPARABLE COUNTS FOR RESPONSES TO SQ118

	NCHILD74		SQ118[a]	
Number of Children	Code	Frequency	Code	Frequency
None	0	18,915	0	16,744
One	1	2,316	1	2,103
Two	2	321	2	296
Three	3	21	3	25
Four	4	8	4	8
Five or more	5	2	5	7
Missing	99	1,069	All others	3,469
Total		22,652		22,652

[a]SQ118 is the number-of-children item on the Second Follow-up Questionnaire. For definitions of the codes, see Levinsohn et al., Vol. 2.

Table 6

FREQUENCY COUNTS FOR NCHILD76 (NUMBER OF CHILDREN IN OCTOBER 1976) WITH COMPARABLE COUNTS FOR RESPONSES TO TQ138B

	NCHILD76		TQ138B[a]	
Number of Children	Code	Frequency	Code	Frequency
None	0	15,241	0	14,862
One	1	3,588	1	3,560
Two	2	1,053	2	1,043
Three	3	128	3	132
Four	4	19	4	21
Five	5	3	5	4
Six or more	6	2	6	8
Missing	99	2,618	All others	3,022
Total		22,652		22,652

[a]TQ138B is the number-of-children item on the Third Follow-up Questionnaire. For definitions of the codes, see Levinsohn et al., Vol. 2.

Table 7

FREQUENCY COUNTS FOR MARDATE (YEAR OF MARRIAGE) WITH COMPARABLE COUNTS FROM THREE FOLLOW-UP SURVEYS

	MARDATE (yr)		FQ7C[a]		SQ106B[a]		TQ130B[a]	
Year of Marriage	Code	Frequency	Code	Frequency	Code	Frequency	Code	Frequency
Before 1965	--	--	--	--	--	--	62,64	2
1965	65	1	--	--	--	--	65	1
1966	66	--	--	--	--	--	--	--
1967	67	2	67	1	67	1	67	2
1968	68	3	68	2	68	2	68	3
1969	69	11	69	9	69	8	69	7
1970	70	67	70,170	57	70,170	46	70	54
1971	71	245	71	213	71,171	188	71	200
1972	72	1,731	72,172	1,449	72,172	1,369	72,172	1,472
1973	73	2,198	73,173	1,579	73,173	1,791	73,173	1,918
1974	74	2,034	74,174	26	74,174	1,596	74,174	1,978
1975	75	1,629	--	--	75,175	10	75,175	1,728
1976	76	1,435	--	--	--	--	76,176	1,578
Legitimate skip[b]	98	10,841						
Missing	99	2,455	All others	19,316	All others	17,641	All others	13,709
Total		22,652		22,652		22,652		22,652

[a]FQ7C, SQ106B, and TQ130B are the items on year of marriage on the three follow-up surveys. For definitions of the codes, see Levinsohn et al., Vol. 2.

[b]This category is for respondents who were still single (never married) as of October 1976.

The logic of our procedures is reflected in the pattern of changes in these tables. Most noticeable are the reductions in the number of unknown or missing responses in going from the original item to the created variable. The largest reductions are for the first follow-up created variables (MAR73 and NCHILD73). Lesser reductions are seen in later follow-ups, reflecting the diminished subsequent information from which to estimate missing values. In some cases, differences between the original items and created variables reflect corrections of inconsistent responses over the three follow-ups (e.g., making the marital status variables consistent with the composite marriage date).

A close examination of Tables 1-3 reveals that the estimated values of the marital status questions follow approximately the same pattern as the known responses. For example, among the persons who responded to the marital status question FQ7A on the first follow-up, 82 percent were single. (See Table 1.) Of the 2997 persons whose marital status was missing on FQ7A and whose marital status was estimated using MAR73, 84 percent were categorized as single.

For the parenthood questions, the problem of missing responses was complicated by the fact that the single respondents were routed around questions FQ8A and FQ8B. For single parents, then, the number of children at the first follow-up usually was not known. However, a number of single respondents violated the routing instructions and responded to questions FQ8A and FQ8B anyway, thus positively identifying themselves as parents and providing known values of NCHILD73. Since the data from this aberrant group is of questionable validity, we intend to exclude them from most phases of our analysis.

It will be noted from Table 4 that most of the unknown responses to FQ8B were changed to "none" in creating NCHILD73. This resulted primarily from our basic premise for estimating missing values, namely, that NCHILD73 $\leq$ NCHILD74 $\leq$ NCHILD76 unless the actual responses indicated otherwise. This led us to replace missing values for FQ8B by "none" whenever NCHILD74 was known to be zero.

In creating NCHILD74, we reduced the number of missing responses to SQ118 from 3469 to 1069. (See Table 5.) Again, the estimated values tend to follow the same pattern as the known responses. The remaining tables furnish comparable information on the other created variables.

II. ESTIMATION PROCEDURES

QUESTIONNAIRE ITEMS USED IN CREATING VARIABLES

The seven parenthood and marital status variables we have created are based on items from all three follow-up surveys. In referring to individual questionnaire items below, we use the same code names that are used in the *Data File Users Manual*. For example, FQ7B refers to Question 7b on the first follow-up questionnaire; SQ118 refers to Question 118 on the second; and so forth. These code names, along with the questions that were used, are listed in Appendix A. The items that were used are summarized in Table 8. Users should note that questions were not always identically worded, nor did they appear in the same order, in each year.* There are clear indications that some respondents were confused by the routing pattern associated with the questions on marital status and number of children on the first follow-up questionnaire (see Appendix A).

PROCEDURE FOR CREATING COMPOSITE FIRST-MARRIAGE DATE

The variable *MARDATE* is our best estimate of the date of first marriage, based on responses to the marriage-date questions in Table 8. What would otherwise be a straightforward estimation procedure is complicated by the fact that reported dates often are inconsistent and occasionally conflict with the marital status the respondent reports.

In each follow-up, respondents who report marital status as "single" are routed around the marriage-date questions, since no marriage date is expected. Therefore, if the subject claims to be single at the last followup, *MARDATE* is coded "98" ("legitimate skip"). If married respondents provide no marriage date, *MARDATE* is coded "99" ("missing").

Respondents may, of course, remarry between surveys, in which case the marriage date given in one year may differ from that given

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*For example, the marriage-date questions on the first two follow-up surveys (FQ7 and SQ106) were worded "When were you first married?" On the third follow-up, the question (TQ130) was: "When was the date of your marriage?"

Table 8

SURVEY ITEMS USED TO ESTIMATE MARITAL AND PARENTHOOD STATUS

Description of Item	Item Numbers[a] First Follow-up (10/73)	Second Follow-up (10/74)	Third Follow-up (10/76)
MARITAL STATUS			
Month of marriage	FQ7B	SQ106A	TQ130A
Year of marriage	FQ7C	SQ106B	TQ130B
Marital status	FQ7A	SQ105	TQ129
With whom respondent lives	FQ4	SQ3	TQ3
PARENTHOOD STATUS			
Whether respondent has any children	FQ8A	-	-
Number of children	FQ8B	SQ118	TQ138B
Number of dependents	FQ10	SQ111	TQ139
Whether respondent plans to have child before October 1974	FQ17	-	-

[a]Corresponds with item numbers shown in Jay R. Levinsohn et al., *National Longitudinal Study: Base Year, First, Second, and Third Follow-up Data File Users Manual*, 2 vols., Research Triangle Institute, Chapel Hill, North Carolina, April 1978.

in the next. Without further information, it is impossible to ascertain whether two successive marriage dates disagree because the dates were misreported or miscoded or because the respondent was married more than once. A further complication stems from a difference in wording: on the third follow-up, the marriage date question fails to refer explicitly to the *first* marriage (as was asked in the first and second follow-up surveys). Owing to this wording difference, the date of a remarriage would be a legitimate response to the third follow-up, but one that would differ from the marriage date(s) previously reported.

In creating *MARDATE*, responses to the marriage date questions (FQ7, SQ106, TQ130) were first checked for out-of-range responses (e.g., a date in the future). The dates also were tested for two possible kinds of conflict with reported marital status: (1) responding "single" to the marital status question (FQ7A, SQ105, or TQ129) but reporting a marriage date that precedes the reference date given in the

marital status question (therefore implying "married"); (2) responding "married" or "separated, divorced, widowed," but reporting a marriage date that follows the question's reference date (therefore implying "single"). A follow-up marriage date is not used in determining *MARDATE* if it fails any of these checks.

Next, the following selection rules are applied (in the order given below) to construct *MARDATE* from the marriage-date information on the first, second, and third follow-ups.

1. Majority rules. The modal date takes precedence over other dates. (This is a simple and satisfactory rule for determining *MARDATE* where one or three dates are given.)
2. Earlier follow-ups take precedence over subsequent follow-ups. If there is no majority (i.e., two or three different dates are reported), the earlier reported marriage date takes precedence. This rule rests on our assumption that a marriage date reported on the earliest survey (hence closer in time to that date) is least susceptible to recall error. Moreover, a marriage date that is reported earlier is more likely to refer to a *first* marriage, our target date.
3. A reported marriage date is ignored if it is inconsistent with a prior marital status. If the marriage date reported on a later follow-up implies a different marital status than was reported on an earlier follow-up, the marriage date is assumed to be either erroneous or a date of remarriage, and it is not used in determining *MARDATE*.*

Despite the complications indicated here, in most cases there are no conflicts among the reported marriage dates, and *MARDATE* is the first reported marriage date.

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*As an illustration, a respondent may state in the first follow-up that he was married as of October 1973, but in the third follow-up give his marriage date as December 1975 (probably a remarriage). In such cases, the later marriage date (December 1975) was ignored when determining *MARDATE*, and the marriage date reported in the first or second follow-up was used instead.

PROCEDURE FOR CREATING MARITAL STATUS VARIABLES

The variables *MAR73*, *MAR74*, and *MAR76* are our best estimates of a respondent's marital status the first week of October in 1973, 1974, and 1976, respectively. Each of these created variables can assume the following values:

1. Single (i.e., never married)
2. Currently married
3. Currently separated, divorced, or widowed
4. Ever married, current status unknown*
99. Unknown

The created marital status variables differ from the responses to the marital status questions (FQ7A, SQ105, and TQ129) in several ways: (1) missing values are estimated where possible, (2) inconsistencies between years are resolved.

Initially, *MAR73*, *MAR74*, and *MAR76* are assigned the values furnished by FQ7A, SQ105, TQ129, recoded into the above categories. Next, respondents who were coded "unknown" on a particular follow-up are reviewed in light of several other variables to see if there is a basis for estimating the marital status. These other variables considered include: *MARDATE*; the marital status variables on the other follow-ups; and responses to questions asking "With whom did you live?" (FQ4, SQ3, TQ3).

In considering these other variables, the following rules were used to estimate missing values of marital status:

1. If the response to the question "With whom did you live?" is "my husband or wife," the subject is recoded "currently married."
2. If the respondent's marital status is "single" on a given follow-up, his marital status is assumed to be single on

*This category is for respondents who are known to have been married on an earlier follow-up but whose marital status now is unknown because of a missing response.

earlier waves. Likewise, respondents who previously were married are coded as "ever married, current status unknown" on all subsequent follow-ups.

3. If *MARDATE* is known, the subject is classified as "single" or "ever married, current status unknown" according to whether the marriage date follows or precedes the reference date. "Ever married" respondents will be further classified as "currently married" if the marriage dates over the follow-ups are in agreement.

The application of the rules in steps 1-3 do not always result in an estimate of the missing marital status responses, owing to variations in the pattern of responses to the marital status questions.

Following the application of these rules to estimate unknown values, the resulting marital status variables are checked for either of two kinds of inconsistency: (1) a sequence of coded marital statuses that is inconsistent over time, and (2) inconsistency between coded marital status in every year and *MARDATE*. In the former case, inconsistencies are resolved by changing marital status on the first follow-up from codes (2), (3) or (4) to code (1) if no marriage dates are given, and both subsequent follow-up marital statuses were "single." Otherwise, marital statuses were changed from "single" to "ever married" when following a marital status of "married," "divorced," or "ever married." In the latter case, the number of conflicts was counted and if two or more follow-up marital status variables conflicted with *MARDATE*, we assumed that *MARDATE* was in error and recoded it "unknown." If only one reported marital status conflicted with *MARDATE*, the conflicting marital status was recoded to agree with the status implied by *MARDATE*.

PROCEDURE FOR CREATING PARENTHOOD VARIABLES

The created variables *NCHILD73*, *NCHILD74*, and *NCHILD76* reflect our estimates of each respondent's number of children and, *ipso facto*, his or her parenthood status as of the first week of October in 1973, 1974, and 1976. Our starting values in creating these variables were the responses to FQ8B, SQ118, and TQ138B, which asked the respondents how many children they had. These initial values were modified when inconsistencies cast doubt on the validity of a response or when there was sufficient information to estimate missing values.

Creating *NCHILD73* proved difficult in part because of the instructions on the first follow-up questionnaire, which routed the single respondents around FQ8A ("Did you have any children as of the first week of October 1973?") and FQ8B ("How many?"). Nonetheless, some single respondents ignored these routing instructions and identified themselves as parents through their answers to FQ8A and FQ8B. For the other single respondents who followed the instructions, we initialized *NCHILD73* to zero except for those who claimed one or more dependents in responding to FQ10, in which case *NCHILD73* was initialized as missing.

A second difficulty in creating *NCHILD73* arose since some respondents gave conflicting answers to FQ8A and FQ8B. Thus, some respondents answered "No" to FQ8A, but then claimed to have one or more children on FQ8B. Many such conflicts appear to have resulted from frivolous responses. Since we wanted to avoid misclassifying respondents as parents when they were not, we initialized *NCHILD73* to zero in these cases.

To estimate missing values, we began with the premise that, other evidence notwithstanding, the number of children is nondecreasing over time.* Thus, missing values for *NCHILD73* and *NCHILD74* were estimated to be zero for respondents who reported having no children on the subsequent survey. By the same principle, if *NCHILD74* was missing but *NCHILD73* and *NCHILD76* had the same value, we estimated *NCHILD74* using their common value. Where either *NCHILD73* or *NCHILD74* was given but not both, we assumed their values differed by at most one and were linked by the response to FQ17 ("Do you plan to have your first [or another] child before October 1974?"). If the answer to FQ17 was "Yes," we estimated missing values assuming that *NCHILD74* = *NCHILD73* + 1; if the answer was "No," we assumed that *NCHILD74* = *NCHILD73*.

The above rules provided estimates for most missing values of *NCHILD73* and *NCHILD74*, but we could do little to estimate missing

*Obviously, this assumption will not always be valid. For example, the number of children can decrease because of childhood mortality or, in the case of marital disruption, where the custody of a child goes to the other spouse.

values for *NCHILD76*. In a few cases, we relied on the change in the number of dependents between successive surveys to estimate missing values. For instance, if *NCHILD76* was missing and if *NCHILD74*, TQ139, and SQ111 were all given, we estimated *NCHILD76* using the formula,

$$NCHILD76 = NCHILD74 + (TQ139 - SQ111),$$

provided that the second term on the right was nonnegative. If none of the above rules yielded estimates due to the pattern of missing responses, we adopted the further assumption that single respondents either had no children or had the same number that they reported in the previous follow-up. Thus, our logic has been to classify single respondents as childless until there was a clear indication that they had become parents.

Since one can give various possible reasons to explain why the number of children might change markedly from one follow-up to the next, checks for inconsistency were made only to eliminate apparently frivolous responses by single persons. If the number of children reported in two successive follow-ups jumped or dropped by three or more, the corresponding values of *NCHILD* were recoded to the minimum of the two reported values.

AN EXAMPLE

As an example of how the program performs, consider the responses below for an actual case (#1523) on the NLS tape.

Item	Response
Marital status	
As of 10/73 (FQ7A)	Never married, but have plans to be
As of 10/74 (SQ105)	Married
As of 10/76 (TQ129)	Married
Marriage date	
Reported in FQ7B-C	Missing
Reported in SQ106A-B	December, 1972
Reported in TQ130A-B	December, 1972

Item	Response
With whom did you live	
As of 10/73 (FQ4)	With husband or wife
As of 10/74 (SQ3)	With other relatives
As of 10/76 (TQ3)	With other relatives
Number of children	
Any children, 10/73? (FQ8A)	Missing
How many, 10/73? (FQ8B)	Missing
How many, 10/74? (SQ118)	None
How many, 10/76? (TQ138B)	Two
Number of dependents	
As of 10/73 (FQ10)	None
As of 10/74 (SQ111)	One
As of 10/76 (TQ139)	None

Based on the marital status responses here, we set the initial values of *MAR73* equal to 1 (single) and those of *MAR74* and *MAR76* equal to 2 (currently married). Following our "majority rules" procedure, we set *MARDATE* equal to "12/72." Note that this date is inconsistent with the value of *MAR73*. The respondent claimed to be single (not divorced, separated, or widowed) as of October 1973, but on subsequent follow-ups, he gave an earlier marriage date. Using our procedure outlined earlier, we recoded *MAR73* to 2 (currently married). This change is consistent with the response to FQ4, indicating that the subject lived with his spouse in October 1973. Although the latter response was not used in this case, it would have been used if there were missing or conflicting marriage dates.

The initial values of *NCHILD73*, *NCHILD74*, and *NCHILD76* were set equal to 99 (missing), 0, and 2. Following our rules above, we estimated *NCHILD73* to be zero based upon the subsequent response to SQ118, indicating the respondent had no children as of October 1974.

Our procedure, then, leads us to conclude that the respondent was married at all three reference dates and first became a parent between the second and third follow-up surveys.

Appendix A

QUESTIONNAIRE ITEMS USED IN CREATING PARENTHOOD AND MARITAL STATUS VARIABLES*

ITEMS FROM THE FIRST FOLLOW-UP QUESTIONNAIRE

FQ4 **4. With whom did you live, as of the first week of October 1973?**

(Circle one.)

By myself 1
Parents 2
With husband or wife 3
With other relatives 4
With person(s) not related to me 5

FQ7A **7a. What was your marital status, as of the first week of October 1973?**

(Circle one.)

Never married, but plan to be married within the next 12 months 1
Never married, and don't plan to be married within the next 12 months ..... 2 } *(SKIP to q. 9)*
Married 3
Separated, divorced, or widowed 4

7b. When were you first married? FQ7B **(month)** FQ7C **(year)**

8. Did you have any children as of the first week of October 1973?

FQ8A No 1
Yes (How many? FQ8B) 2

FQ10 **10. As of the first week of October 1973, how many persons (not counting yourself) were dependent upon YOU for more than one half of their financial support?**

(Circle one.)

None 0
One 1
Two 2
Three or more 3

*Refer to Levinsohn, et al., Vol. 1, Appendix A.

FQ17 17. **Do you plan to have your first child (or another child) before October 1974?**

(Circle one.)

Yes 1
No 2
Don't know 3

ITEMS FROM THE SECOND FOLLOW-UP QUESTIONNAIRE

SQ3 3. **With whom did you live as of the first week of October 1974?**

(Circle one.)

By myself 1
With my parents 2
With my husband or wife 3
With parents and husband or wife 4
With other relatives 5
With person(s) not related to me 6

SQ105 105. **What was your marital status, as of the first week of October 1974?**

(Circle one.)

Never married, but plan to be married within the next 12 months 1
Never married, and don't plan to be married within the next 12 months ..... 2 } *GO TO Q. 110, next page*
Divorced, widowed, separated 3
Married ..... 4 *GO TO Q. 106*

106. **When were you first married?** ___SQ106A___ (month) ___SQ106B___ (year)

SQ111 111. **Not including yourself, how many persons were dependent upon YOU for more than one half of their financial support as of the first week of October 1974.**

(Circle one.)

0....1....2....3....4 or more

SQ118 118. **As of the first week of October 1974, how many children did you have?**

(Circle one.)

0....1....2....3....4....5 or more

ITEMS FROM THE THIRD FOLLOW-UP QUESTIONNAIRE

TQ3 3. **With whom did you live as of the first week of October 1976?**

(Circle one.)

By myself 1
With my parents 2
With my husband or wife 3
With parents and husband or wife 4
With other relatives 5
With person(s) not related to me 6

TQ129 129. **What was your marital status, as of the first week of October 1976?**

(Circle one.)

Never married, but plan to be married within the next 12 months 1
Never married, and don't plan to be married within the next 12 months 2
} *GO TO Q. 137, next page*

Divorced, widowed, separated 3
Married 4
} *CONTINUE WITH Q. 130*

130. **What was the date of your marriage?**

TQ130A (month) TQ130B (year)

TQ138B b. **As of the first week of October 1976, how many children did you have?**

(Circle one.)

0 ... 1 ... 2 ... 3 ... 4 ... 5 ... 6 or more

TQ139 139. **Not including yourself, how many persons were dependent upon you for more than one-half of their financial support as of the first week of October 1976?**

(Circle one.)

0 ... 1 ... 2 ... 3 ... 4 ... 5 ... 6 or more

APPENDIX B

A FORTRAN SUBROUTINE FOR ESTIMATING MARITAL AND PARENTHOOD STATUS

The FORTRAN subroutine CLASS, listed beginning on the next page, is intended for use with a calling program in which the input and output variables are assigned to two common blocks, INPT and OUTP. Given the values of the input variables for a particular NLS respondent, the program calculates the values of MAR73, MAR74, MAR76, NCHILD73, NCHILD74, NCHILD76, and MARDATE, and stores the results in three output vectors M, NCH, and MDATE as indicated below.

Output vector	Number of components	Identification of components
M	3	M(1) = MAR73 M(2) = MAR74 M(3) = MAR76
NCH	3	NCH(1) = NCHILD73 NCH(2) = NCHILD74 NCH(3) = NCHILD76
MDATE	2	MDATE(1) = MARDATE month MDATE(2) = MARDATE year

The input variables used in the subroutine are as follows:

Label	Position	Description
FQ4	1344-1345	With whom did you live as of 10/1/73?
FQ7A	1352-1353	Marital status as of 10/1/73
FQ7B	1354-1356	What month were you first married?
FQ7C	1357-1359	What year were you first married?
FQ8A	1360-1362	Any children as of 10/1/73?
FQ8B	1363-1365	How many children as of 10/1/73?
FQ10	1368-1369	How many dependents as of 10/1/73?
FQ17	1449-1450	Plan first child before 10/1/74?
FQCMON	2731-2732	First follow-up completion date (month)
FQCYR	2735-2736	First follow-up completion date (year)
SQ3	2874-2875	With whom did you live as of 10/1/74?
SQ105	3932-3933	Marital status as of 10/1/74
SQ106A	3934-3936	What month were you first married?
SQ106B	3937-3939	What year were you first married?
SQ111	3994-3996	How many dependents as of 10/1/74?
SQ118	4050-4051	How many children as of 10/1/74?
SQCMON	4390-4391	Second follow-up completion date (month)
SQCYR	4394-4395	Second follow-up completion date (year)
TQ3	4613-4614	With whom did you live as of 10/1/76?
TQ129	6672-6673	Marital status as of 10/1/76
TQ130A	6674-6676	What was the month of your marriage?
TQ130B	6677-6679	What was the year of your marriage?
TQ138B	6762-6763	How many children as of 10/1/76?
TQ139	6766-6767	How many dependents as of 10/1/76?
TQCMON	7620-7621	Third follow-up completion date (month)
TQCYR	7624-7625	Third follow-up completion date (year)

```
      SUBROUTINE CLASS
C     ************************************************************
C     *          PROGRAM TO ESTIMATE PARENTHOOD AND              *
C     *          MARITAL STATUS FOR NLS RESPONDENTS              *
C     ************************************************************
      IMPLICIT INTEGER (A-N)
      COMMON/INPT/FQ4,FQ7A,FQ7B,FQ7C,FQ8A,FQ8B,FQ10,FQ17,
     *  SQ3,SQ105,SQ106A,SQ106B,SQ111,SQ118,
     *  TQ3,TQ129,TQ130A,TQ130B,TQ138B,TQ139,
     *  FQCMON,FQCYR,SQCMON,SQCYR,TQCMON,TQCYR
      COMMON/OUTP/M(3),NCH(3),MDATE(2)
      DIMENSION MT(3),DSTA(3),F(3),MF(3),C(3),FDATE(2,3)
      LOGICAL DTST1,DTST2
      INTEGER FQ4,FQ7A,FQ7B,FQ7C,FQ8A,FQ8B,FQ10,FQ17,
     *  SQ3,SQ105,SQ106A,SQ106B,SQ111,SQ118,
     *  TQ3,TQ129,TQ130A,TQ130B,TQ138B,TQ139,
     *  FQCMON,FQCYR,SQCMON,SQCYR,TQCMON,TQCYR
      INTEGER M,NCH,MDATE
C     STORE FOLLOW-UP COMPLETION DATES IN FDATE(2,3) MATRIX
      EQUIVALENCE (FDATE(1,1),FQCMON)
C     DATE FUNCTION - MONTH AND YEAR CONVERTED TO MONTHS
C     FROM JAN 1965 (I = MONTH, J = YEAR)
      DATE(I,J) = I + (J-65) * 12
C     DTST1 - INDICATES IF DATE IS WITHIN RANGE
      DTST1(I) = (I.GT.0.AND.I.LT.156)
C     DTST2 - INDICATES IF FIRST DATE IS AFTER SECOND DATE
      DTST2(I,J) = (I.LE.J.OR.J.EQ.-9)
C     ************************************************************
C     *                  DATE STORAGE VECTORS                    *
C     *                                                          *
C     *    F(3) CONTAINS CODED REFERENCE DATES                   *
C     *         CORRESPONDING TO OCT 73, OCT 74, OCT76;          *
C     *         E.G., F(1) = DATE(10,73)                         *
C     *                                                          *
C     *    C(3) CONTAINS CODED SURVEY COMPLETION DATES           *
C     *                                                          *
C     *    MF(3) CONTAINS CODED MARRIAGE DATES                   *
C     ************************************************************
C     FILL IN DATE VECTORS
      F(1) = DATE(10,73)
      F(2) = DATE(10,74)
      F(3) = DATE(10,76)
C
C     CHECK RANGE OF COMPLETION DATE
      DO 8 I = 1,3
      C(I) = DATE(FDATE(1,I),FDATE(2,I))
C     IF OUT OF RANGE SET TO MISSING
      IF (.NOT.DTST1(C(I)).OR..NOT.DTST2(F(I),C(I))) C(I) = -9
    8 CONTINUE
      MF(1) = DATE(MOD(FQ7B,100),MOD(FQ7C,100))
      MF(2) = DATE(MOD(SQ106A,100),MOD(SQ106B,100))
      MF(3) = DATE(MOD(TQ130A,100),MOD(TQ130B,100))
```

```
C     ************************************************************
C     *    COMPUTE INITIAL ESTIMATES OF MARITAL STATUS           *
C     *           MARITAL STATUS - POSSIBLE VALUES               *
C     *               99 = MISSING                               *
C     *                1 = SINGLE (PLANS OR NO PLANS)            *
C     *                2 = MARRIED                               *
C     *                3 = DIVORCED                              *
C     *                4 = ONCE MARRIED,                         *
C     *                      PRESENT STATUS UNCERTAIN            *
C     ************************************************************
C
C     INITIALIZE MARITAL STATUS M-VECTOR TO MISSING (99)
      DO 12 I = 1,3
   12 M(I) = 99
C     COMPUTE INITIAL VALUES OF MAR73 = M(1)
      IX = MOD(FQ7A,10)
      IF (IX.LE.2) M(1) = 1
      IF (IX.EQ.3) M(1) = 2
      IF (IX.EQ.4.AND.FQ7A.LT.90) M(1) = 3
C     COMPUTE INITIAL VALUES OF MAR74 = M(2)
      IX = MOD (SQ105,10)
      IF (IX.LE.2) M(2) = 1
      IF (IX.EQ.3) M(2) = 3
      IF (IX.EQ.4.AND.SQ105.LT.90) M(2) = 2
C     COMPUTE INITIAL VALUES OF MAR76 = M(3)
      IX = MOD(TQ129,10)
      IF (IX.LE.2) M(3) = 1
      IF (IX.EQ.3) M(3) = 3
      IF (IX.EQ.4.AND.TQ129.LT.90) M(3) = 2
C
C     ************************************************************
C     *             COMPUTE COMPOSITE MARRIAGE DATE              *
C     ************************************************************
C
C     COMPUTE DSTA CATEGORIZING MARRIAGE DATE FOR EACH FOLLOW-UP
C                      DSTA-POSSIBLE VALUES
C            0  =  MARRIAGE DATE IS MISSING
C            1  =  DATE IS PRESENT AND DOES NOT CONFLICT
C                      WITH MARITAL STATUS
C            2  =  MARITAL STATUS IS SINGLE,
C                      SO MARRIAGE DATE NOT EXPECTED
C            3  =  DATE IS PRESENT, BUT CONFLICTS WITH
C                      MARITAL STATUS
      DO 24 I = 1,3
      DSTA(I) = 0
C     IF INITIAL MARITAL STATUS IS SINGLE THEN MARRIAGE DATE
C    *  IS NOT EXPECTED / SET MF(I) TO ZERO
      IF(M(I).NE.1) GO TO 25
      MF(I) = 0
      DSTA(I) = 2
      GO TO 24
```

```
C     CHECK RANGE OF FOLLOW-UP MARRIAGE DATA
C
   25 IF (.NOT.DTST1(MF(I)).OR..NOT.DTST2(MF(I),C(I)))
     * GO TO 28
      DSTA(I) = 1
C     IF RESPONDENT HAS REMARRIED (E.G., CHANGE IN
C     MARITAL STATUS FROM DIVORCED TO MARRIED) DO NOT USE
C     THIRD FOLLOW-UP MARRIAGE DATE WHEN COMPUTING MARDATE.
      IF (I.EQ.3) GO TO 23
      I1 = 3 - I
      DO 21 I2 = 1,I1
      IF (M(I).EQ.3.AND.M(I+I2).EQ.2) GO TO 22
   21 CONTINUE
      GO TO 23
   22 MF(3) = 0
      DSTA(3) = 0
      GO TO 24
   23 DO 27 I2 = 1,I
      IF ((M(I2).EQ.1.AND.(MF(I)-F(I2).LE.0)).OR.
     * ((M(I2).GT.1.AND.M(I2).NE.99).AND.(MF(I)-F(I2).GT.0)))
     * DSTA(I) = 3
   27 CONTINUE
      GO TO 24
C     DATE IS MISSING - CHANGE MF(I) TO MISSING
   28 MF(I) = -9
   24 CONTINUE
C     DETERMINE IF THREE MARRIAGE DATES ARE PRESENT
C         AND NOT IN CONFLICT
      IF (DSTA(1).NE.1.OR.DSTA(2).NE.1.OR.DSTA(3).NE.1)
     * GO TO 45
C
C     CHECK FOR PATTERN OF DATE CONFLICTS THAT WOULD USE
C     THE SECOND DATE AS THE COMPOSITE MARRIAGE DATE
      IF (IABS(MF(1)-MF(2)).GT.3.AND.IABS(MF(1)-MF(3)).GT.3
     * .AND.IABS(MF(2)-MF(3)).LT.3) DSTA(1) = 3
C     IF DATA FITS PATTERN LOWER FIRST DSTA (1 ==> 3)
C     SO SECOND DATE WILL BE SELECTED FOR MARRIAGE DATE
C
C     MOVE HIGHEST PRIORITY DATE TO COMPOSITE MARRIAGE DATE
   45 DO 47 I1 = 1,3,2
      DO 47 I2 = 1,3
C     USABLE MARRIAGE DATE FOUND / LEAVE LOOP
      IF (DSTA(I2).EQ.I1) GO TO 48
   47 CONTINUE
C     NO USEABLE MARRIAGE DATE FOUND / SET MARDATE TO MISSING
      MDATEX = -9
      GO TO 51
C     SET MARDATE
   48 MDATEX = MF(I2)
   51 CONTINUE
```

```
C     ********************************************************
C     *            COMPUTE MISSING MARITAL STATUS            *
C     ********************************************************
C     COMPUTE MISSING MARITAL STATUS FOR 1976 (3RD FOLLOW-UP)
      IF (M(3).NE.99) GO TO 53
      IF (TQ3.NE.3) GO TO 54
      M(3) = 2
      GO TO 53
   54 IF (MDATEX.EQ.-9) GO TO 55
      M(3) = 4
      IF (MDATEX-F(3).GT.0) M(3) = 1
      GO TO 53
   55 IF (M(2).GT.1.AND.M(2).NE.99) M(3) = 4
   53 CONTINUE
C     COMPUTE MISSING MARITAL STATUS AT FOR 1974 (2ND FOLLOW-UP)
      IF (M(2).NE.99) GO TO 59
      IF (SQ3.NE.3) GO TO 56
      M(2) = 2
      GO TO 59
   56 IF (MDATEX.EQ.-9) GO TO 57
C     COMPUTE MARITAL STATUS FROM COMPOSITE MARRIAGE DATE
      M(2) = 1
      IF (MDATEX-F(2).GT.0) GO TO 59
      M(2) = 4
C     IF SUBJECT IS MARRIED IN 1976 AND THERE IS NO REASON
C     TO BELIEVE A REMARRIAGE HAS TAKEN PLACE
C     THEN RESET M(2) TO 2
      IF (M(3).EQ.2.AND.(MF(1).LE.0.OR.MF(3).LE.0
     *  .OR.MF(3)-MF(1).LE.3)) M(2) = 2
      GO TO 59
C     MARDATE MISSING / COMPUTE MARITAL STATUS FROM OTHER INFO
   57 IF (M(3).NE.1) GO TO 58
      M(2) = 1
      GO TO 59
   58 IF (M(1).GT.1.AND.M(1).NE.99) M(2) = 4
   59 CONTINUE
C     COMPUTE MISSING MARITAL STATUS IN 1973 (1ST FOLLOW-UP)
      IF (M(1).NE.99) GO TO 64
      IF (FQ4.NE.3) GO TO 60
      M(1) = 2
      GO TO 64
   60 IF (MDATEX.EQ.-9) GO TO 61
C     COMPUTE MARITAL STATUS FROM C-MARRIAGE DATE
      M(1) = 1
      IF (MDATEX-F(1).GT.0) GO TO 64
      M(1) = 4
      IF (M(2).EQ.2) M(1) = 2
      GO TO 64
C     MARDATE MISSING / COMPUTE MARITAL STATUS FROM OTHER INFO
   61 IF (M(2).EQ.1) M(1) = 1
   64 CONTINUE
```

```
C     CHECK FOR MARITAL STATUS INCONSISTENCIES
      IF (MDATEX.NE.-9) GO TO 72
C     INCONSISTENCY TYPE I - MARRIED IN 1973 AND SINGLE IN 1974
C     OR MARRIED IN 1974 AND SINGLE IN 1976
      IF (M(2).NE.1.OR.M(3).NE.1) GO TO 71
      M(1) = 1
      GO TO 79
   71 DO 70 I = 2,3
      I2 = I - 1
      IF (M(I).EQ.99.OR.M(I2).EQ.99) GO TO 70
      IF (M(I).EQ.1.AND.M(I2).GT.1) M(I) = 4
   70 CONTINUE
      GO TO 79
C     INCONSISTENCY TYPE II - MARDATE/MARITAL STATUS CONFLICT
C     MARRIAGE DATE KNOWN
C     COUNT NUMBER OF MARDATE VS. MARITAL STATUS CONFLICTS
   72 MCNT = 0
      DO 73 I = 1,3
      MT(I) = 0
      IF (MDATEX-F(I).LE.0) MT(I) = 1
      IF ((MT(I).NE.0.OR.M(I).EQ.1).AND.
     * (MT(I).NE.1.OR.(M(I).GT.1.AND.M(I).LE.4))) GO TO 73
      MCNT = MCNT + 1
C     STORE NUMBER OF FOLLOW-UP THAT CONTAINED CONFLICT
      I2 = I
   73 CONTINUE
C     NO MARRIAGE DATE VS MARITAL STATUS CONFLICTS / LEAVE
      IF (MCNT.EQ.0) GO TO 79
C     IF 2 OR MORE CONFLICTS BETWEEN MARRIAGE DATE AND
C     MARITAL STATUS THEN SET MARRIAGE DATE TO MISSING
      IF (MCNT.GE.2) GO TO 76
C     ONLY ONE CONFLICT WITH MARRIAGE DATE -
C     CHANGE THAT MARITAL STATUS TO AGREE WITH MARRIAGE DATE
C     IF THE MARRIAGE DATE FALLS ON THE REFERENCE DATE THEN
C     DON'T CHANGE THE MARITAL STATUS RESPONSE (THE SUBJECT
C     COULD HAVE BEEN MARRIED IN THE LATTER PART OF THE MONTH)
C
      IF (MDATEX-F(I2).EQ.0) GO TO 79
C
      M(I2) = 1
      IF (MDATEX-F(I2).GT.0) GO TO 79
      M(I2) = 4
      IF (I2.LE.2.AND.M(I2+1).EQ.2) M(I2) = 2
      IF (I2.EQ.3.AND.M(2).EQ.3) M(3) = 3
      GO TO 79
C     CHANGE MARITAL STATUS TO MISSING
   76 MDATEX = -9
   79 CONTINUE
C     IF SINGLE AT THIRD FOLLOW-UP SET MARDATE TO BLANK (98)
      IF (M(1).EQ.1.AND.M(2).EQ.1.AND.M(3).EQ.1.AND.MDATEX.EQ.-9)
     * GO TO 96
```

```
C     COMPUTE MARRIAGE DATE MONTH AND YEAR FROM MONTHS
C
C     IF MDATEX NOT EQUAL TO MISSING (-9), COMPUTE DATE.
C     OTHERWISE SET MARRIAGE DATE TO MISSING.
      IF (MDATEX.NE.-8) GO TO 97
   96 MDATE(1) = 98
      MDATE(2) = 98
      MDATEX = -9
      GO TO 99
   97 IF (MDATEX.NE.-9) GO TO 98
      MDATE(1) = 99
      MDATE(2) = 99
      GO TO 99
   98 MDATE(1) = MOD(MDATEX,12)
      MDATE(2) = MDATEX/12 + 65
      IF (MDATE(1).NE.0) GO TO 99
      MDATE(1) = 12
      MDATE(2) = MDATE(2) - 1
   99 CONTINUE
C     ********************************************************
C     *            COMPUTE NUMBER OF CHILDREN                *
C     *                AT EACH FOLLOW-UP                     *
C     ********************************************************
C     PRESCRIBE INITIAL VALUES OF CHILDREN (NCH) AS MISSING
C
      DO 80 I = 1,3
   80 NCH(I) = 99
C
C     COMPUTE: NCH(1) = NUMBER OF CHILDREN IN 1973
      IX = MOD(FQ8A,10)
      IY = MOD(FQ8B,100)
      IF (IY.LT.5) NCH(1) = IY
      IF (IX.EQ.1) NCH(1) = 0
      IF (IX.GE.3.AND.IY.GE.5.AND.M(1).EQ.1.AND.
     * (FQ10.EQ.0.OR.FQ10.GT.3)) NCH(1) = 0
C     COMPUTE: NCH(2) = NUMBER OF CHILDREN IN 1974
      IF (SQ118.LT.90) NCH(2) = SQ118
C     COMPUTE: NCH(3) = NUMBER OF CHILDREN IN 1976
      IF (TQ138B.LT.90) NCH(3) = TQ138B
C
C     IF NCH(*) IS MISSING, SET EQUAL TO ZERO IF
C           THE SUBSEQUENT RESPONSE IS ZERO
C
      DO 81 I = 1,2
      IF (NCH(3-I).NE.99) GO TO 81
      IF (NCH(4-I).EQ.0) NCH(3-I) = 0
   81 CONTINUE
C
C     IF NCH(1) IS STILL MISSING, MAKE FURTHER ATTEMPTS
C     TO ESTIMATE THE NUMBER OF CHILDREN IN 1973
```

```
      IF (NCH(1).NE.99) GO TO 83
      IF (NCH(2).EQ.99) GO TO 183
      IF (FQ17.GE.3) GO TO 283
      NCH(1) = MIN0(4,NCH(2) + FQ17 - 2)
      GO TO 83
  283 IF (FQ10.GE.90.OR.SQ111.GE.90.OR.SQ111.LT.FQ10)
     * GO TO 183
      NCH(1) = MAX0(0,NCH(2)-(SQ111-FQ10))
      NCH(1) = MIN0(4,NCH(1))
      GO TO 83
  183 IF (M(1).NE.1.AND.FQ10.GT.0) GO TO 83
      NCH(1) = 0
   83 CONTINUE
C     IF NCH(2) IS STILL MISSING, ATTEMPT TO ESTIMATE
      IF (NCH(2).NE.99) GO TO 84
      IF (NCH(1).EQ.99) GO TO 384
      IF (NCH(3).EQ.99.OR.NCH(1).LT.NCH(3)) GO TO 184
      NCH(2) = NCH(1)
      GO TO 84
  184 IF (FQ17.GE.3) GO TO 284
      NCH(2) = NCH(1) + 2 - FQ17
      GO TO 84
  284 IF (FQ10.GE.90.OR.SQ111.GE.90.OR.SQ111.LT.FQ10) GO TO 384
      NCH(2) = MAX0(0,NCH(1)+(SQ111-FQ10))
      NCH(2) = MIN0(5,NCH(2))
      GO TO 84
  384 IF (M(2).NE.1.AND.SQ111.GT.0) GO TO 84
      NCH(2) = 0
      IF (NCH(1).NE.99) NCH(2) = NCH(1)
   84 CONTINUE
C     IF NCH(3) IS STILL MISSING ATTEMPT TO ESTIMATE
      IF (NCH(3).NE.99) GO TO 85
      IF (NCH(2).EQ.99.OR.TQ139.GT.90.OR.SQ111.GT.4.OR.
     * TQ139.LT.SQ111) GO TO 185
      NCH(3) = MAX0(0,NCH(2)+(TQ139-SQ111))
      NCH(3) = MIN0(6,NCH(3))
      GO TO 85
  185 IF (M(3).NE.1.AND.TQ139.GT.0) GO TO 85
      NCH(3) = 0
      IF (NCH(2).NE.99) NCH(3) = NCH(2)
   85 CONTINUE
C
C     CHECK FOR CHANGES IN THE NUMBER OF CHILDREN EXCEEDING 2
C
      DO 90 I = 2,3
      IF (NCH(I).EQ.99.OR.NCH(I-1).EQ.99) GO TO 90
      IX = NCH(I) - NCH(I-1)
      IF (M(I).EQ.1.AND.IX.GE.3) NCH(I) = NCH(I-1)
   90 CONTINUE
C
      RETURN
      END
```